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ONTARIO WATER
RESOURCES COMMISSION

ANNUAL REPORT 1965

NEPEAN

water pollution control plant

DIVISION OF PLANT OPERATIONS
Ontario Water Resources Commission

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ONTARIO WATER RESOURCES COMMISSION

OFFICE OF THE GENERAL MANAGER

Members of the Nepean Local Advisory Committee,
Township of Nepean.

Gentlemen:

I am pleased to provide you with the 1965 Annual Report for the Nepean Water Pollution Control Plant, OWRC Project No. 59-S-35.

We appreciate the co-operation you have extended to our Operations staff throughout the year, and trust that continuation of this close association will ensure even greater progress in the sphere of water pollution control.

Yours very truly,

D. S. Caverly,
General Manager.

ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

J. A. VANCE, LL.D.
CHAIRMAN

J. H. H. ROOT, M.P.P.
VICE-CHAIRMAN

D. S. CAVERLY
GENERAL MANAGER

W. S. MacDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am pleased to provide you with the 1965 Annual Report on the operation of the Nepean Water Pollution Control Plant, OWRC Project No. 59-S-35.

The report presents design data, outlines operating problems encountered during the year and summarizes in graphs, charts and tables all significant flow and cost data.

Yours very truly,

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

This report provides useful information on the operating efficiency of this project during 1965. It is intended to act as a guide in gauging plant performance. To implement that aim, it includes detailed statistical and cost data, a description of the project and a summary of its operation during the year.

Of particular interest will be the cost data, which show the total cost to the municipality and the areas of major expenditure.

The Regional Operations Engineer is primarily responsible for the preparation of the report, and has compiled and arranged the material. He will be pleased to answer any questions regarding it. Other groups, however, were involved in the production, and these include the statistics section, the Drafting Section of the Division of Sanitary Engineering and the Division of Finance.

B. C. Palmer, P. Eng.,
Director,
Division of Plant Operations.

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NEPEAN

water pollution control plant

operated for

THE TOWNSHIP OF NEPEAN

by

THE ONTARIO WATER RESOURCES COMMISSION

CHAIRMAN: Dr. James A. Vance

VICE-CHAIRMAN: J. H. H. Root, M.P.P.

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F. A. Voege
K. H. Sharpe
A. K. Watt

COMMISSION SECRETARY

W. S. MacDonnell

DIVISION OF PLANT OPERATIONS

DIRECTOR: B. C. Palmer

Assistant Director: C. W. Perry
Regional Supervisor: D. A. McTavish
Operations Engineer: J. N. Dick

801 Bay Street Toronto 5

'65 REVIEW

It is the purpose of this report to give significant data on the operation of the Township of Nepean Water Pollution Control Plant for 1965.

The average daily flow to the plant in 1965 was 2.42 mgd. The flow to the plant exceeded the design flow of 1.5 mgd 90 percent of the time. The average daily flow to the plant was 1.85 mgd in 1963 and 1.99 mgd in 1964. This is a yearly increase of approximately 300,000 gpd.

The operating costs for the treatment plant and the two associated pumping stations in 1965 was $32,490.61. The operating costs have been very consistent at this plant since operation started in 1962. These costs were $31,138.25, $31,925.64 and $31,159.12 in 1962, 1963, and 1964, respectively.

The cost of treatment per million gallons of sewage was approximately $47.18, $47.08, $42.89 and $36.67 for the years 1962, 1963, 1964 and 1965, respectively. These costs have decreased with time as a result of the increase in flows.

The 1965 Power costs were not realistic since only 11 power bills were paid. Chlorine costs have increased due to greater flows. General Supplies and Equipment purchases have also increased. The Repairs and Maintenance costs have fluctuated since more repairs are required some years.

The Sundry costs in 1965 decreased considerably subsequent to the purchase of a pick-up truck in the spring of 1965. All travel for plant business and pumping station inspections and repairs were made with the pick-up truck.

In 1965, an additional sludge lagoon was constructed. A 32-22 HP electric motor at the Shirley's Bay Pumping Station burned out and had to be rewound. In February of 1965, the No. 2 pump in the Shirley's Bay pumping station was rebuilt.

The inverted syphon crossing the east branch of Still Water Creek had to be unblocked twice in 1965.

A sewage gas meter was also purchased for the plant to measure the gas production of the digester.

Inspections conducted by head office engineers and technicians in 1965 revealed satisfactory operation of the plant and maintenance of equipment.

GLOSSARY

BOD	biochemical oxygen demand (a measure of organic content)
cfm	cubic feet per minute
comminution	shredding of solids into small fragments
DWF	dry weather flow
effluent	outflow
flocculation	bringing very small particles together to form a larger mass (the floc) before settling
fps	feet per second
gpcd	gallons per capita per day
gpm	gallons per minute
grit	sand, dust, stones, cinders and other heavy inorganic material
influent	inflow
lin. ft.	lineal feet
mgd	million gallons per day
mlss	mixed liquor suspended solids
ppm	parts per million
ss	suspended solids
TDH	total dynamic head (usually refers to pressure on a pump when it is in operation)

HISTORY
1959 - 1965

INCEPTION

On January 12, 1959, the Council of the Township of Nepean passed a resolution requesting the Ontario Water Resources Commission to undertake the construction of a trunk sewer line and sewage treatment plant. The Township Engineer, J. A. Chalmers, was engaged to prepare plans and specifications for the trunk sewer and the firm of Beaco Limited to prepare plans and specifications for the sewage treatment plant.

APPROVAL

In 1959, the Township of Nepean signed an agreement with the Ontario Water Resources Commission to finance, construct and operate the system.

CONSTRUCTION

Spino Construction Company Limited, Montreal, Quebec and Keystone Contractors Limited, Ottawa, Ontario began the construction of the trunk sewer early in 1960. George A. Crain and Sons Limited, Ottawa, Ontario began the construction of the sewage treatment plant in 1961. Late in the year 1961, the Division of Plant Operations took over the operation of the plant.

TOTAL COST

59-S-35	$1,444,574.46
61-S-76	160,984.91



D. FORBES
CHIEF OPERATOR

Project Staff

Operators: B. Arcand
G. Crouch

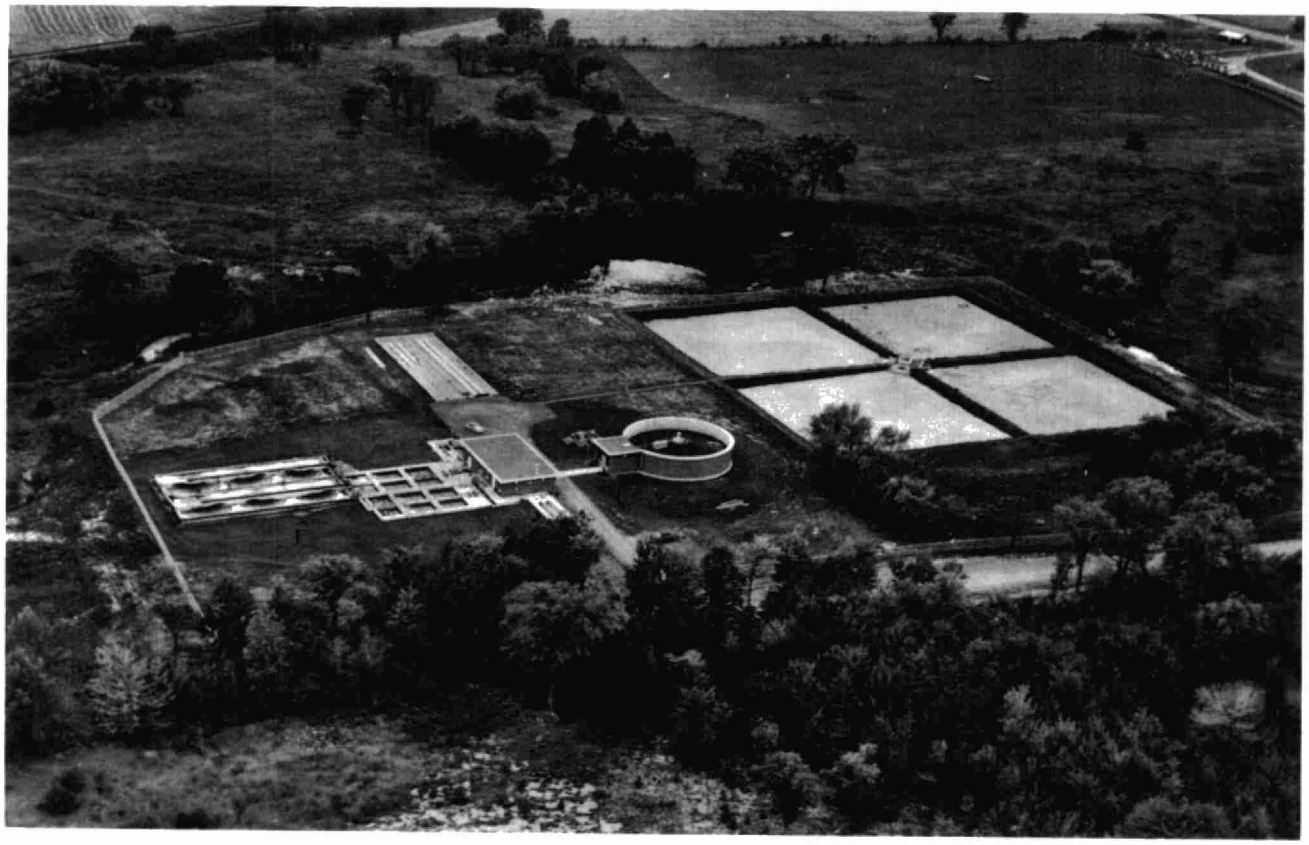
COMMENTS

The Shirley's Bay Water Pollution Control Plant and the two associated pumping stations are operated by a staff complement of three men. Casual labour was again employed in the summer months to help in the maintenance of the plant grounds and to fill in during vacation leaves.

Mr. Forbes completed the gas fitters course that was conducted by the Department of Energy and Resources in Belleville during 1965. In 1966 it will be mandatory for persons working on gas equipment to be licensed by the Province of Ontario.

Mr. Crouch successfully completed the primary and intermediate Water Pollution Control Plant Operator's Course that was offered by the Ontario Water Resources Commission in Toronto.

The staff has carried out its duties in the operation of the plant in a satisfactory manner.



Description of Project

INFLUENT WORKS

The waste from the north east section of the Township of Nepean is directed by gravity sewers and trunk sewers to the Woodroffe Avenue pumping station. At the Woodroffe Avenue pumping station the waste is lifted into a 30 inch trunk sewer that follows the northern limit of the township picking up waste from Bell's Corners and other subdivisions along the way and conveying it to the Shirley's Bay pumping station.

The raw waste is pumped from the Shirley's Bay pumping station via a 16 inch force main to the influent works of the plant. In the influent works, the waste flows through a bar screen where any large objects are removed and then into either one of two grit channels. In the grit channels, the flow is regulated so that the grit and sand settle out but the organic material remains in suspension. The grit channels are occasionally drained and the settled material manually removed and discarded.

PRIMARY SETTLING TANKS

In the two rectangular primary settling tanks, the waste is retained for 1.62 hours at design flow and approximately 50 percent of the suspended matter settles to the bottom of the tanks. Each settling tank is equipped with a scraper mechanism which moves the settled sludge to a hopper located at the bottom of the tank. The sludge is pumped from the settling tank to the digestion tank. Floating material is skimmed off the top of the tank and also pumped to the digestion tank.

AERATION

Settled sewage from the primary settling tanks flows by gravity to the aeration tanks where it is mixed with biologically active sludge which is returned from the final settling tanks. In the aeration tanks, the waste is retained for 6.75 hours at design flow to enable the biologically active floc to oxidize and assimilate the polluting organic matter still remaining in the waste.

It is possible to add primary effluent to the aeration tanks at various points. This permits the use of modifications to the activated sludge process such as step aeration.

Air and agitation is supplied to the process by six mechanical aerators equipped with two 15 HP motors. The tank contents are turned over every 15 minutes.

FINAL SETTLING TANKS

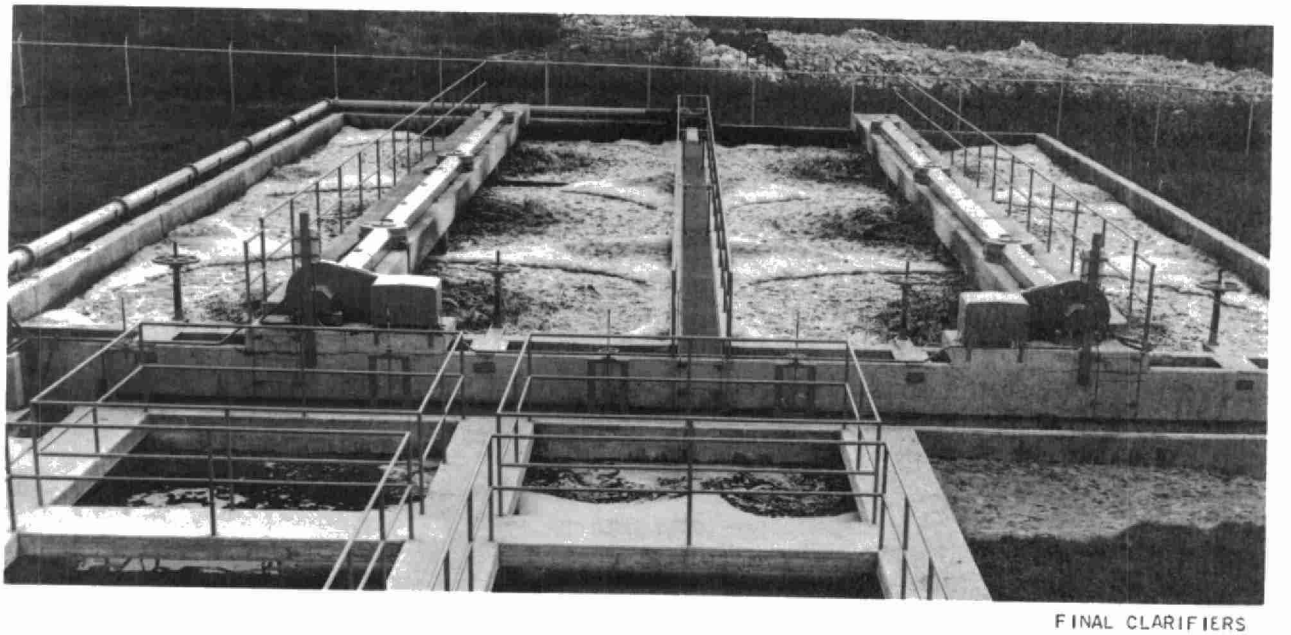
The mixed liquor from the aeration section is retained in the final settling tanks for 1.62 hours at design flow and allows the activated sludge to settle in the tanks. The sludge is scraped to the one end of the tank by a scraper mechanism and collected on the bottom of the tanks from where it is pumped by two 800 IGPM pumps to a splitter box. The splitter box is employed to control the wasting of excess sludge to the primary settling tanks. The remaining liquid flows over the weirs of the final settling tanks and is chlorinated in the chlorine contact chamber for approximately 15 minutes and then flows to Watts Creek as the final effluent.

SLUDGE DIGESTION TANKS

The Township of Nepean utilizes single stage digestion. The sludge from the primary settling tanks is automatically pumped to the digester by a pre-set timer mechanism.

The digester is equipped with a floating steel cover. The contents of the digester are mixed by a Perth gas recirculating system which collects the gas produced by the decomposition of the sludge and forces it back into the contents under pressure. Heat is applied to the digester by a heat exchanger located in the control building. The digester contents are circulated through the heat exchanger by two 150 US GPM pumps.

The digested sludge can be pumped on to the sludge drying beds or to the sludge lagoons. Here it is dried and used for land fill.



FINAL CLARIFIERS

PROJECT COSTS

59-S-35

NET CAPITAL COST (Final)		$1,444,574.46
DEDUCT - Payments from Municipalities	$670,000.00	
Long Term Debt to OWRC		$ 774,574.46
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1965		$ 67,089.64
Net Operating		$ 32,490.61
Debt Retirement		15,651.00
Reserve		9,049.36
Interest Charged		43,459.03
TOTAL		$ 100,650.00

RESERVE ACCOUNT

Balance at January 1, 1965	$ 22,085.86
Deposited by Municipality	9,049.36
Interest Earned	1,336.41
	$ 32,471.63
Less Expenditures	(3,694.85)
Balance at December 31, 1965	$ 28,776.78

NET CAPITAL COST (Final) Long Term Debt to OWRC	$160,984.91
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1965	$ 14,477.02
Net Operating	$ 8.49
Debt Retirement	3,249.00
Reserve	916.78
Interest Charged	9,032.41
TOTAL	$ 13,206.68

RESERVE ACCOUNT

Balance at January 1, 1965	$ 3,437.16
Deposited by Municipality	916.78
Interest Earned	209.39
	$ 4,563.33
Less Expenditures	-
Balance at December 31, 1965	$ 4,563.33

MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY	WATER
JAN	1758.60	975.62		126.54			12.24	8.89	546.31	89.00	
FEB	2429.50	975.62		425.86	545.29		36.34		298.27	148.12	
MARCH	2077.51	1157.71			509.04		127.19	55.05	66.74	161.78	
APRIL	2671.43	1174.19			547.85		49.03	18.72	73.86	807.78	
MAY	2932.59	1560.99	126.99	99.32	633.99		69.71		261.31	180.28	
JUNE	3489.51	1040.66	151.32		536.17	448.95	130.40	396.83	673.12	112.06	
JULY	3011.13	1093.23	180.00	9.24	526.03		47.42	70.00	1064.88	20.33	
AUG	3177.02	1064.94	300.00	99.75	554.24	456.29	200.84	416.82		84.14	
SEPT	2147.59	1076.58	130.80		537.90		223.06	77.13	73.59	28.53	
OCT	2778.81	1597.41			589.33	268.83	75.82	(2.50)	159.94	89.98	
NOV	2296.49	1147.92		37.93	571.87		186.39	339.03	(17.03)	30.38	
DEC	3720.43	1099.15			1180.95		147.27	588.02	634.68	70.36	
TOTAL	32490.61	13964.02	889.11	798.64	6732.66	1174.07	1305.71	1967.99	3835.67	1822.74	

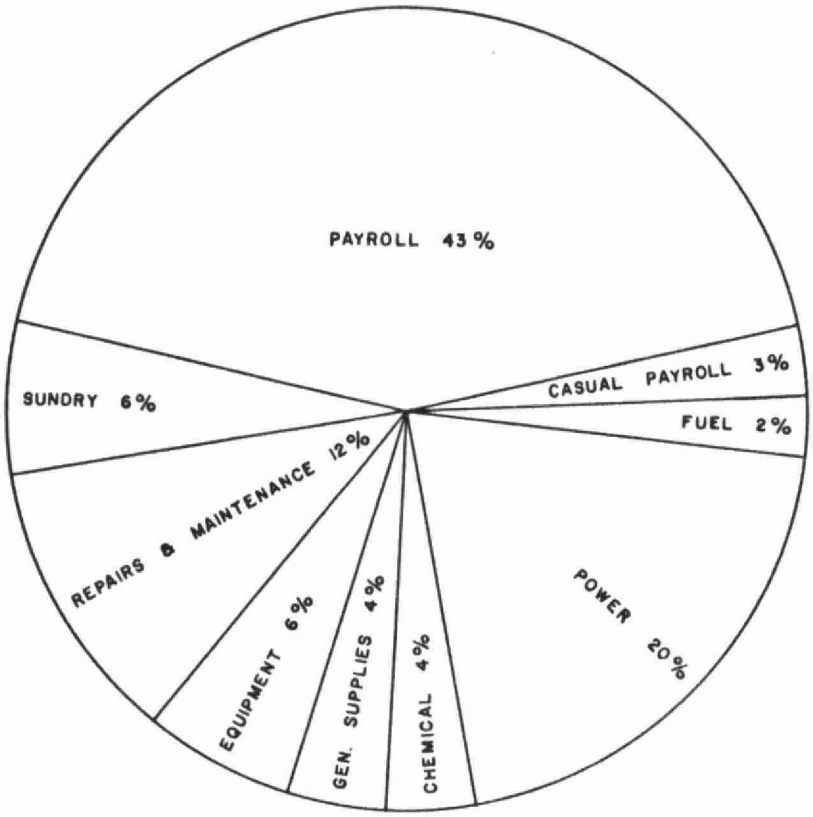
BRACKETS INDICATE CREDIT

YEARLY OPERATING COSTS

YEAR	M.G. TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB. OF BOD REMOVED
1962	660.0*	$ 31128.25	$ 47.18	7 CENTS
1963	678.8	$ 31925.64	$ 47.08	14 CENTS
1964	726.4	$ 31159.12	$ 42.89	7 CENTS
1965	886.1	$ 32490.61	$ 36.67	9 CENTS

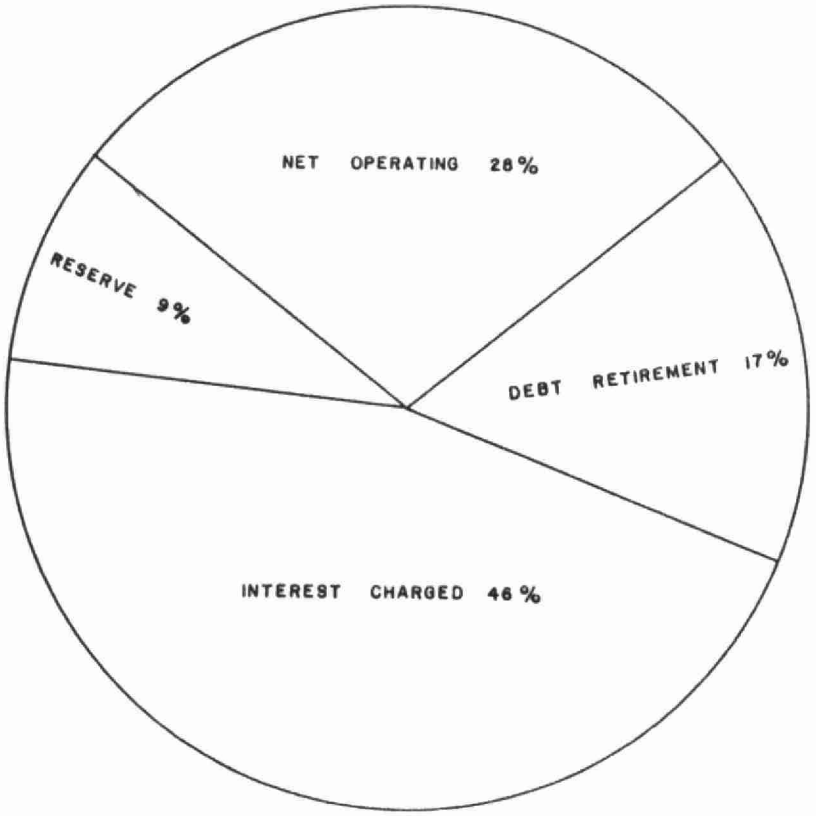
*prorated on six months' data

1965 OPERATING COSTS

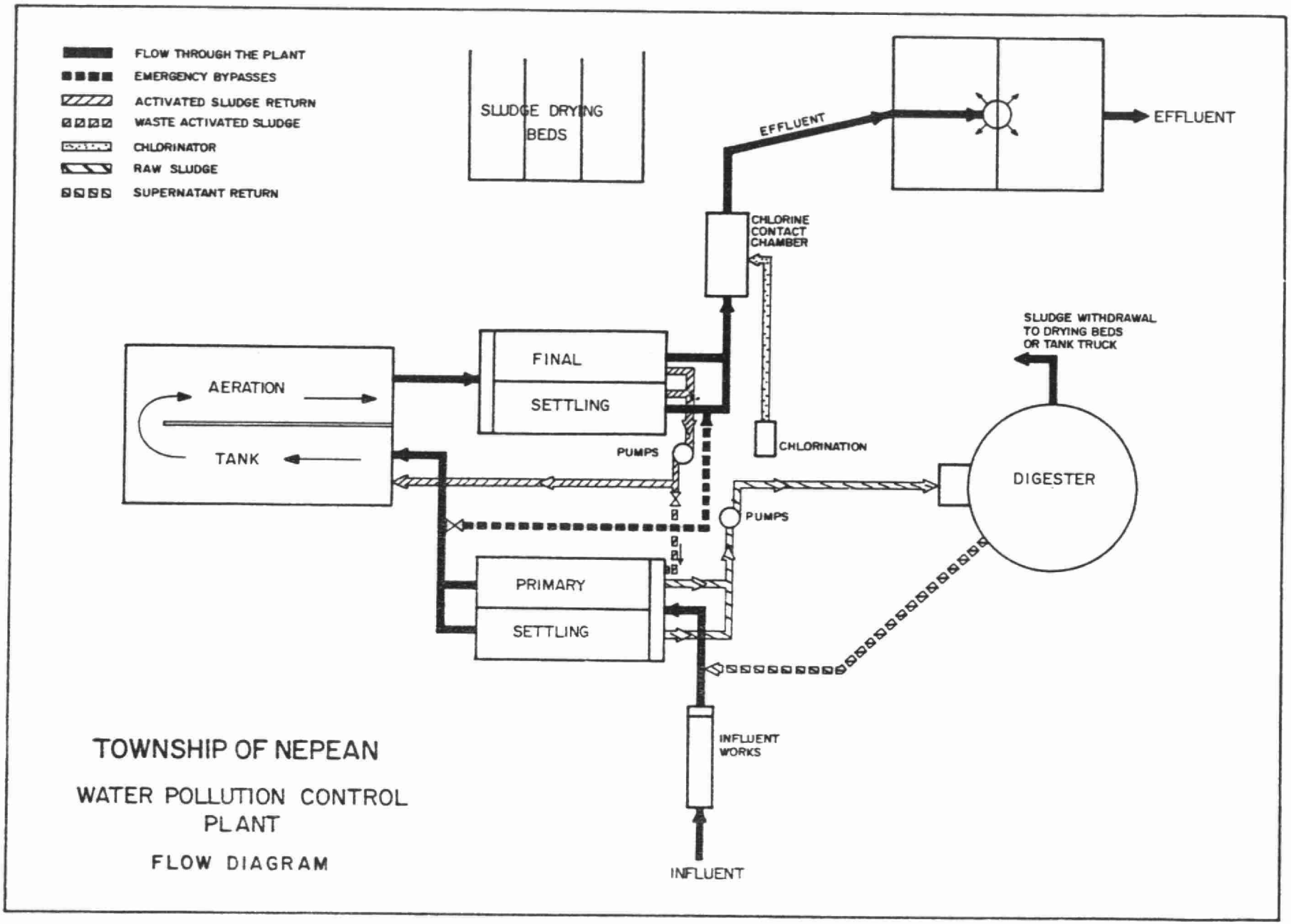


TOTAL ANNUAL COST

(BOTH PROJECTS)



Technical Section


FLOW THROUGH THE PLANT
EMERGENCY BYPASSES
ACTIVATED SLUDGE RETURN
WASTE ACTIVATED SLUDGE
CHLORINATOR
RAW SLUDGE
SUPERNATANT RETURN
SLUDGE DRYING BEDS
EFFLUENT
EFFLUENT
CHLORINE CONTACT CHAMBER
SLUDGE WITHDRAWAL TO DRYING BEDS OR TANK TRUCK
FINAL
SETTLING
AERATION
TANK
PUMPS
CHLORINATION
DIGESTER
PUMPS
PRIMARY
SETTLING
INFLUENT WORKS
INFLUENT
TOWNSHIP OF NEPEAN
WATER POLLUTION CONTROL PLANT
FLOW DIAGRAM

Design-Data

GENERAL

Type of Plant - Activated sludge.

Design Population - 15,000 persons.

Per Capita Flow - 100 gallons per capita per day.

Design Plant Flow - 1,500,000 gallons per day.

Five Day BOD -

Raw Sewage	-	140 PPM
Removal	-	95%

Suspended Solids -

Raw Sewage	-	295 PPM
Removal	-	90%

PRIMARY TREATMENT

Influent Sewer

Sixteen inch force main from Shirley's Bay pumping station.

Screening

Manually cleaned bar screen with two inch spaces.

Grit Removal

Two manually cleaned grit removal channels - 35'6" x 3'6" x 1'6".

Volume - 184 cubic feet or 1150 Imperial gallons.

Detention period - 1.11 minutes at design flow.

PRIMARY SETTLING TANKS

Units - Two 60' x 15' x 9'.

Total volume - 16,200 cubic feet or 101,000 Imperial gallons.

Detention time - 1.62 hours at design flow.

Surface Settling Rate - 835 Imperial gallons per square foot of tank per day

Weir Overflow Rate - 9450 Imperial gallons per lineal foot of weir per day.

Manually operated scum troughs.

SECONDARY TREATMENT

Aeration Section

Two rectangular aeration tanks - 90' x 30' x 12'6".

Total volume - 67,500 cubic feet, or 420,000 Imperial gallons.

Detention time - 6.75 hours at a design flow of 1.5 MGD.

Air Supply

Six mechanical type aerators.

Simplex high intensity aerating cones as manufactured by Ames Crosta Mills Co. Ltd.

Secondary Settling Tanks

Two rectangular concrete settling tanks with United Steel Corporation Limited collectors.

Units - Two 60' x 15' x 9'.

Total volume - 16,200 cubic feet or 101,000 Imperial gallons.

Detention time - 1.62 hours at design flow.

Surface Settling Rate - 835 Imperial gallons per square foot of tank per day.

Weir Overflow Rate - 9150 Imperial gallons per lineal foot of weir per day.

The return sludge is pumped to a splitter box from sludge wet well by two "Allispede" Smart-Turner Machine Co. Ltd. pumps of 800 IGPM capacity.

Digester

One concrete tank 60 feet in diameter by 21' SWD.

Total volume - 59,200 cubic feet or 370,000 Imperial gallons.

The tank covered by a Pacific Flush Tank Company floating steel cover and contents agitated by a 150 cubic feet per minute Pearth Gas Recirculation Unit.

Loading - 4.0 cubic feet per capita. 2.02 pounds solids per cubic foot of tank per month.

Disposal - Sludge drying beds and sludge lagooning.

Heat Exchanger

One Pacific Flush Tank Company No. 370 heat exchanger.

Chlorination

Dimension of Tank - 32' x 16' x 5' 6" - 2,820 cubic feet or 17,600 gallons.

Detention time - 17 minutes at design flow.

One Wallace and Tiernan chlorinator, Type A-731.

Sand Filters

Four sand filter beds 175' x 175' each.

Used during summer months.

PUMPING STATIONS

Woodroffe Avenue Pumping Station

Unit No. 1

10 HP electrically driven "Buffalo" pump - 300 USGPM @ 46 foot TDH. RPM - 1150.

Unit No. 2

20 HP electrically driven "Buffalo" pump - 850 USGPM @ 46 foot TDH. RPM - 1150.

Unit No. 3

25 HP electrically driven "Buffalo" pump - 1400 USGPM @ 46 foot TDH. RPM - 900

Standby Engine - Wisconsin air-cooled Type - VG-40.

Shirley's Bay Pumping Station

Unit No. 1

30/22 HP electrically driven "Buffalo" pump.

Capacity - 1165 GPM @ 25 foot TDH @ 860 rpm

RPM - 1150, 860

Impeller Size - 12 1/2 inches.

Unit No. 2

30/22 HP electrically driven "Buffalo" pump.

Capacity - 1165 GPM @ 25 foot TDH @ 860 rpm
RPM - 1150, 860

Impeller Size - 13.0 inches.

Process Data

PROBABILITY PLOT

It will be noted that in 1965 the plant received 1.5 mgd or more, 90 percent of the time. It will also be noted that the curves become steeper from 1963 to 1965. This indicates that high flows are being experienced at the plant more frequently.

The probability curves terminate at approximately 3.5 mgd because this is the capacity of the Shirley's Bay Pumping Station. Flows greater than approximately 3.5 mgd are by-passed at the Shirley's Bay Pumping Station and this probably occurred 10 percent of the time during 1965.

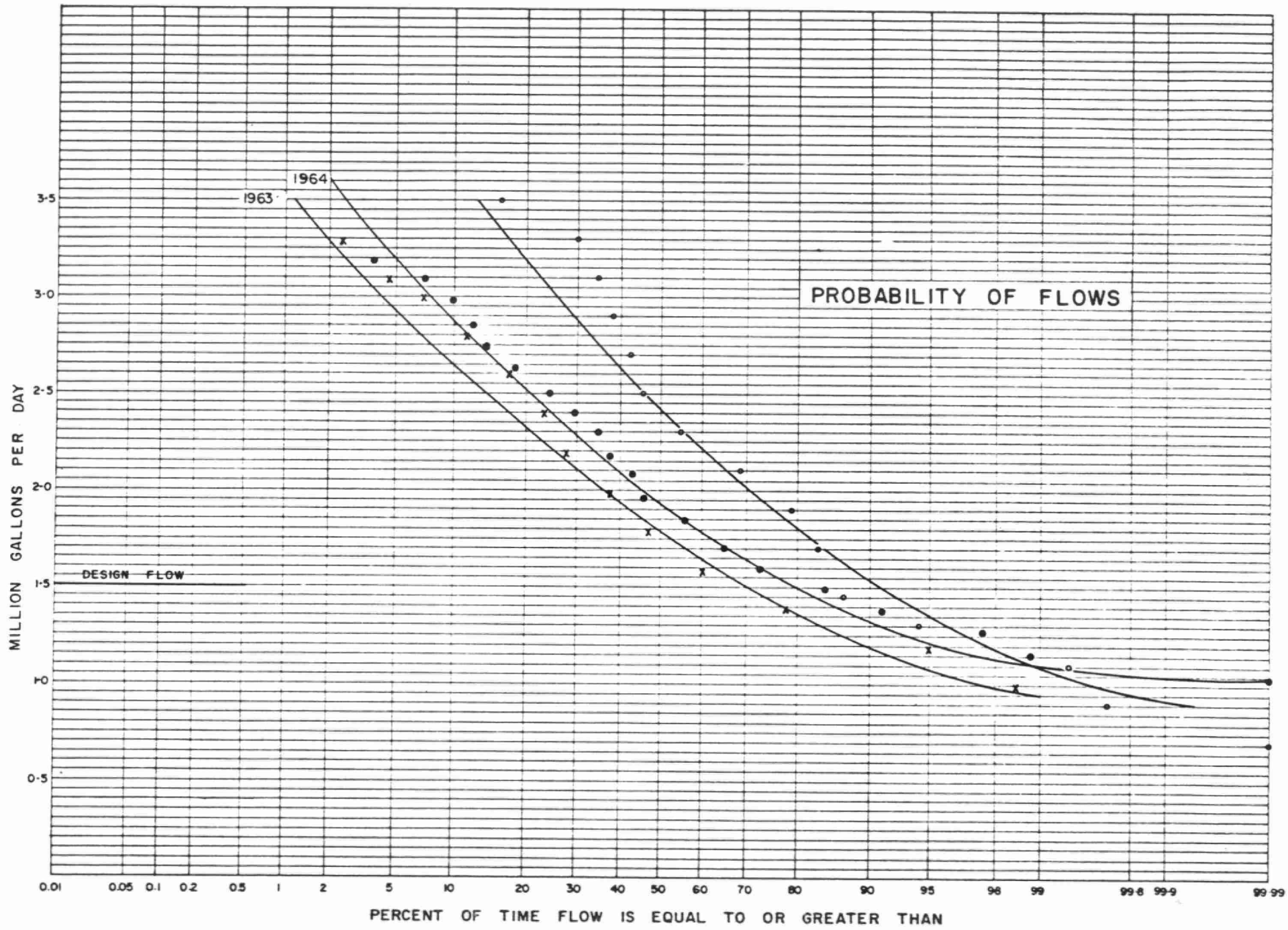
1965 DAILY FLOW

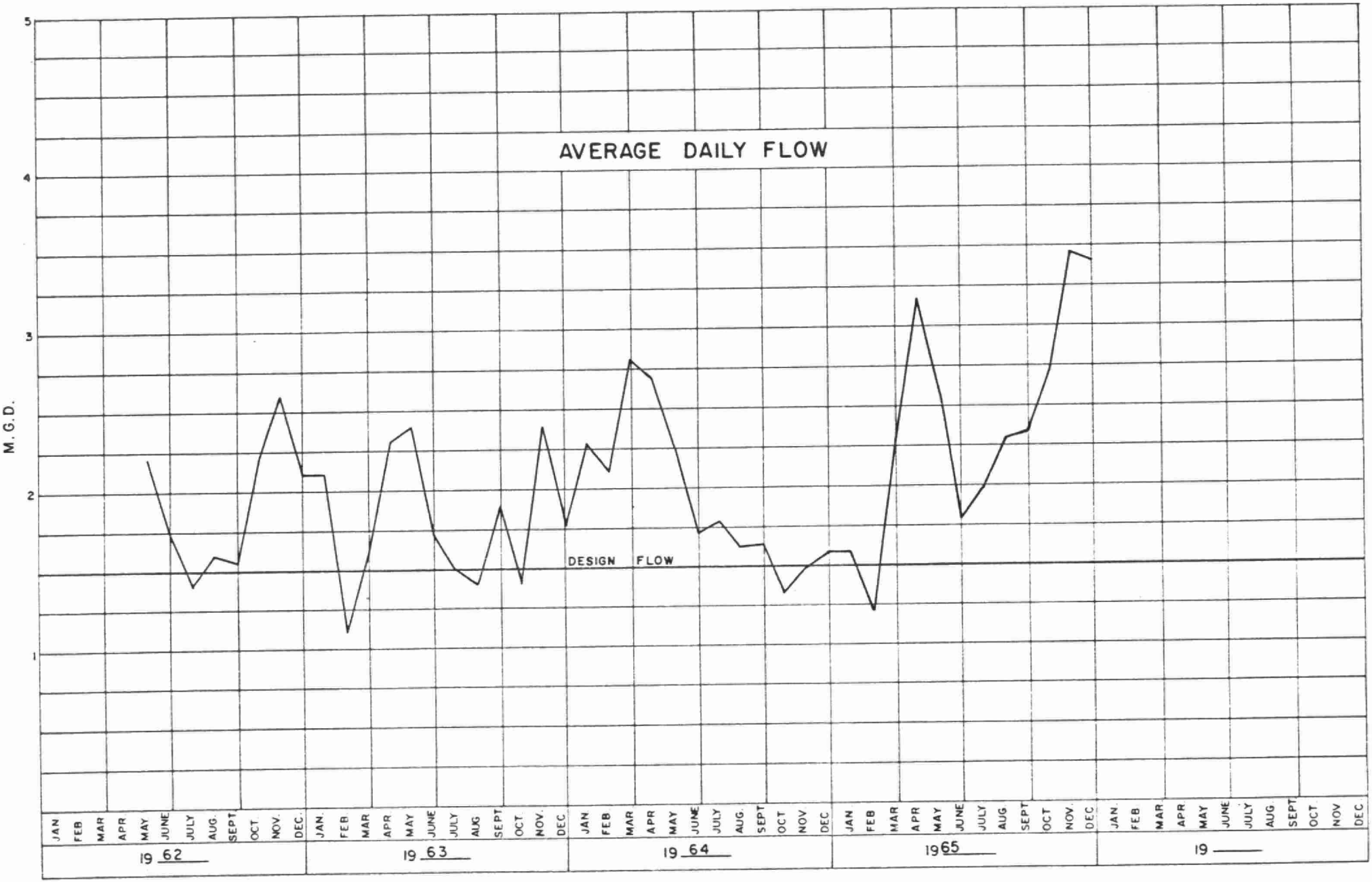
It should be noted from the daily flow graph for 1965, that dry weather flows were received at the plant during the latter part of January, the month of February; and the months of June and July. During the other months of the year, storm water was received at the plant. When the rains started in August the flows also increased to the plant and during the months of April, November and December, the plant was operating at full hydraulic loading.

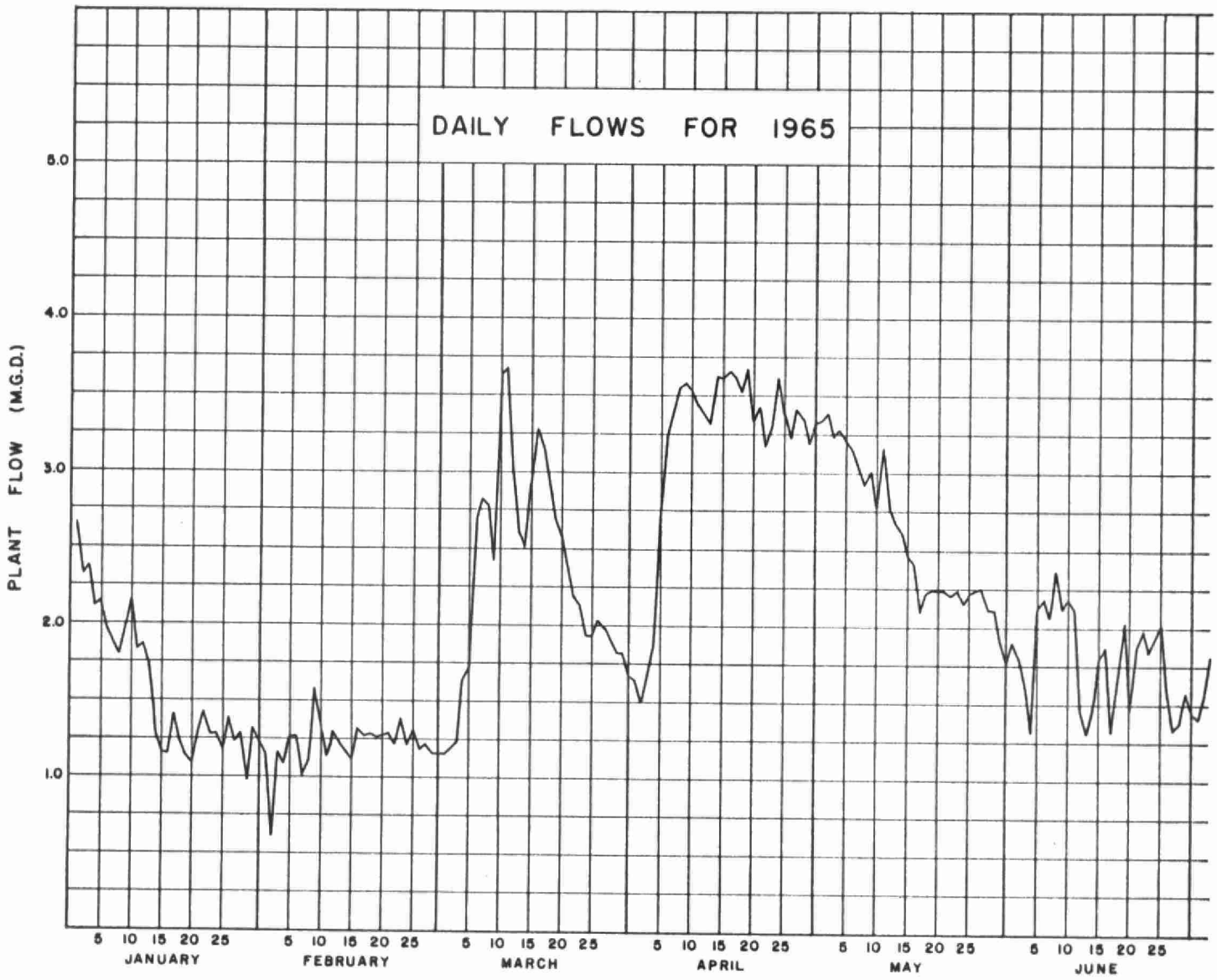
When the flows to the plant reach 3.5 mgd, it is possible that by-passing occurred into Watts Creek.

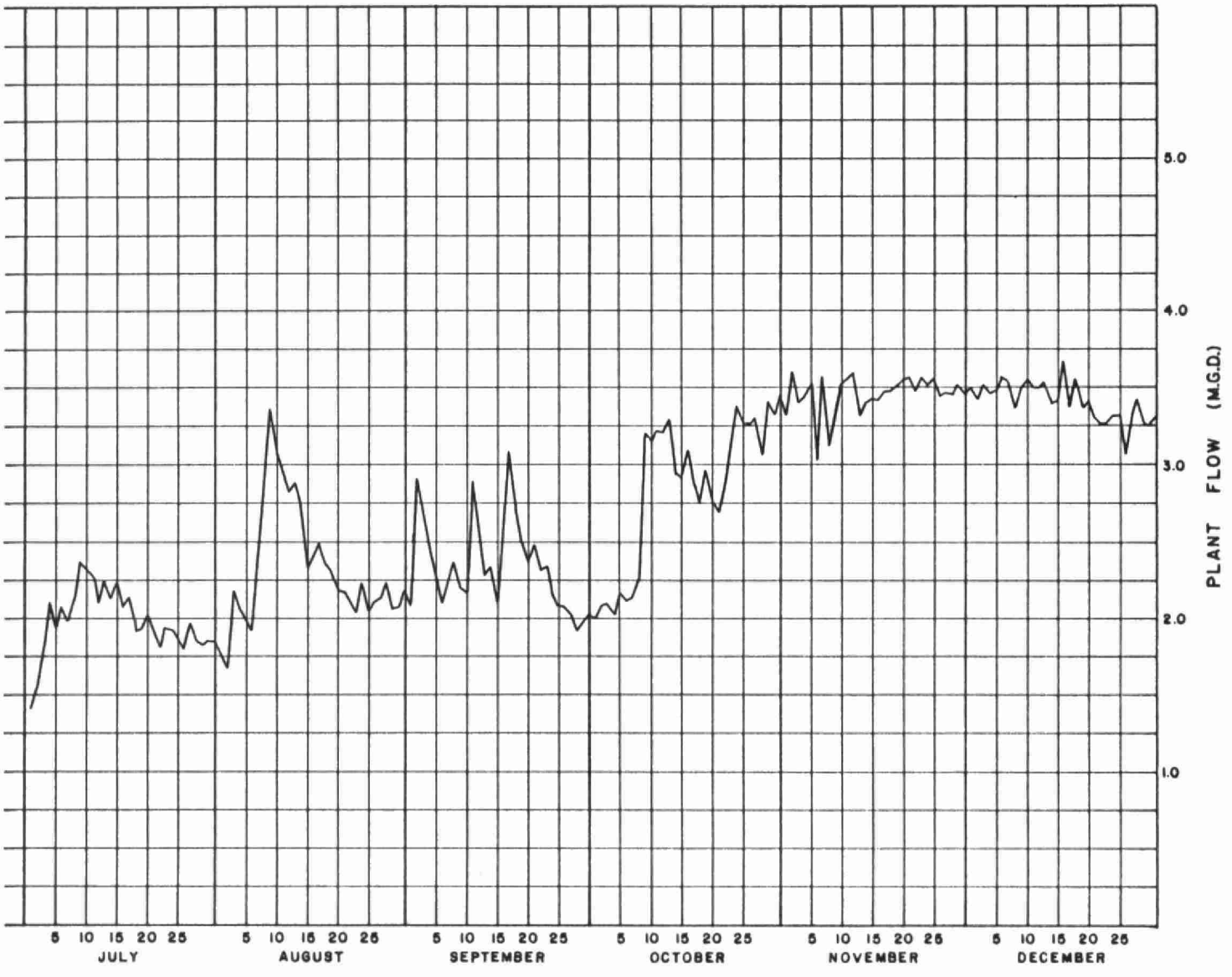
PRECIPITATION

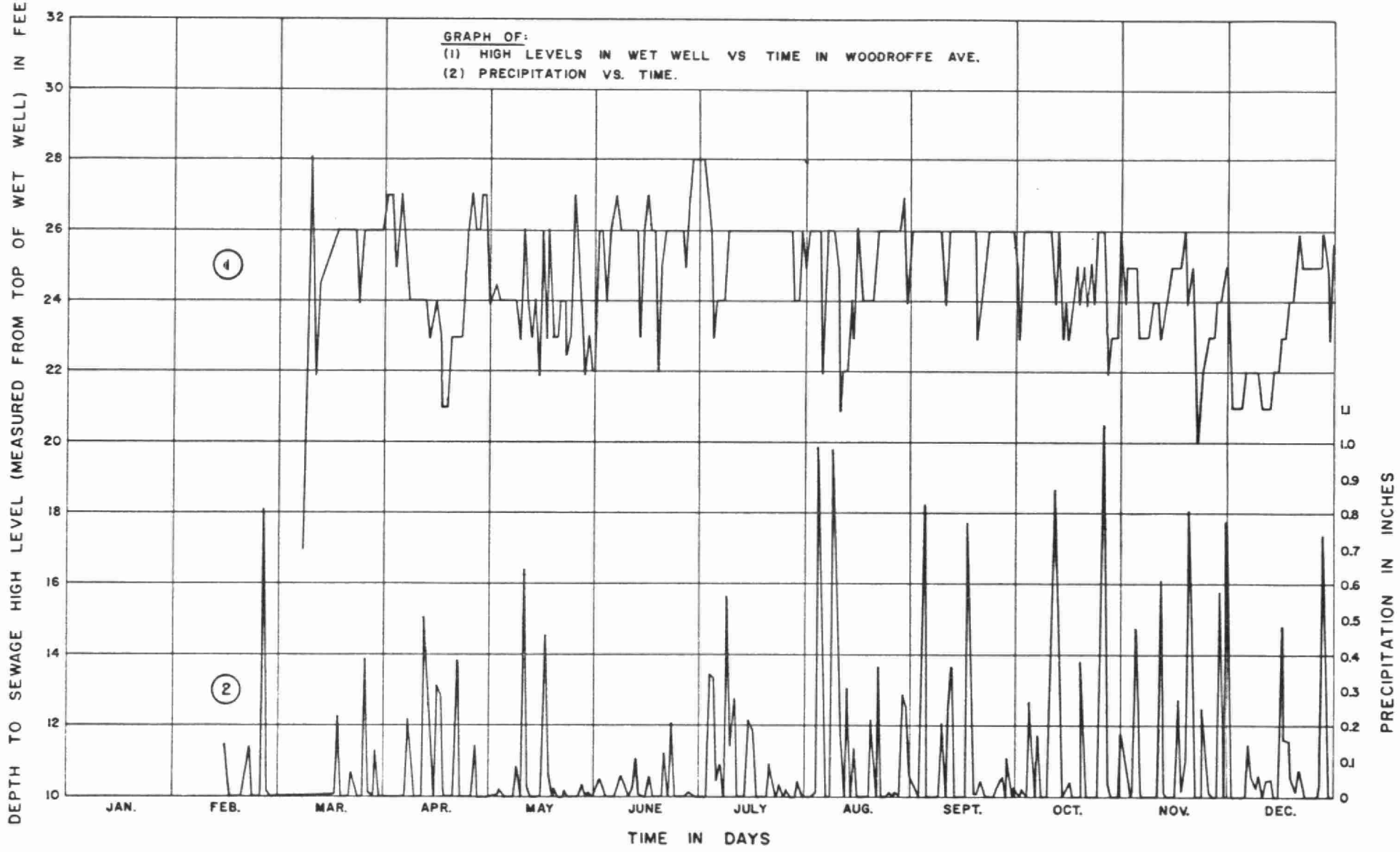
This graph (page 24) is included in this report to show the relationship of rainfall in the area to water levels in the Woodroffe Avenue pumping station. The top curve shows the water level in the Woodroffe Avenue wet well for every day of the year beginning about the middle of March. The bottom curve shows the amount of precipitation on various days of the year.

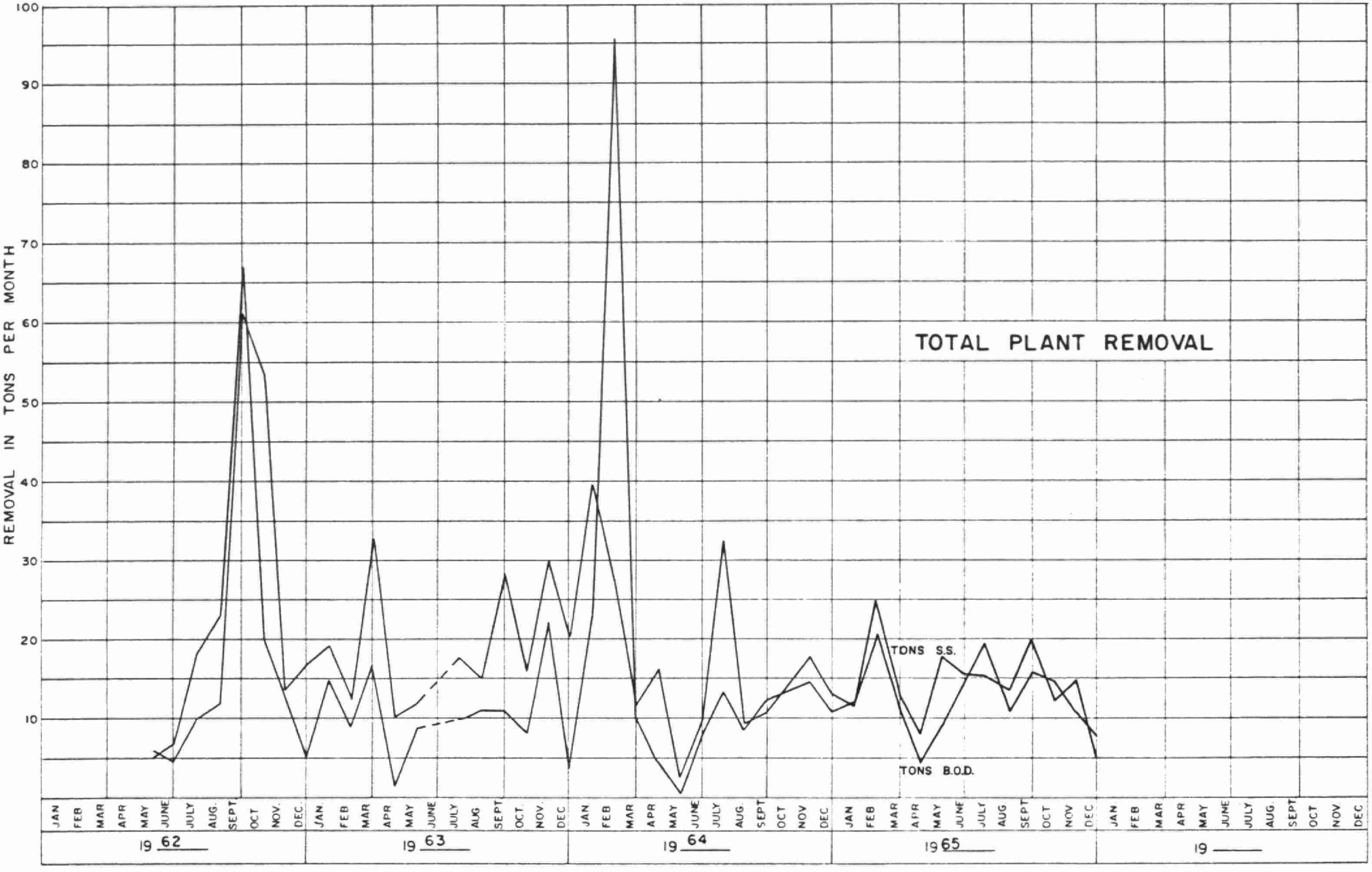

PROBABILITY OF FLOWS
1964
1963
DESIGN FLOW
MILLION GALLONS PER DAY
3·5
3·0
2·5
2·0
1·5
1·0
0·5
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99·8
99·9
99·99
PERCENT OF TIME FLOW IS EQUAL TO OR GREATER THAN

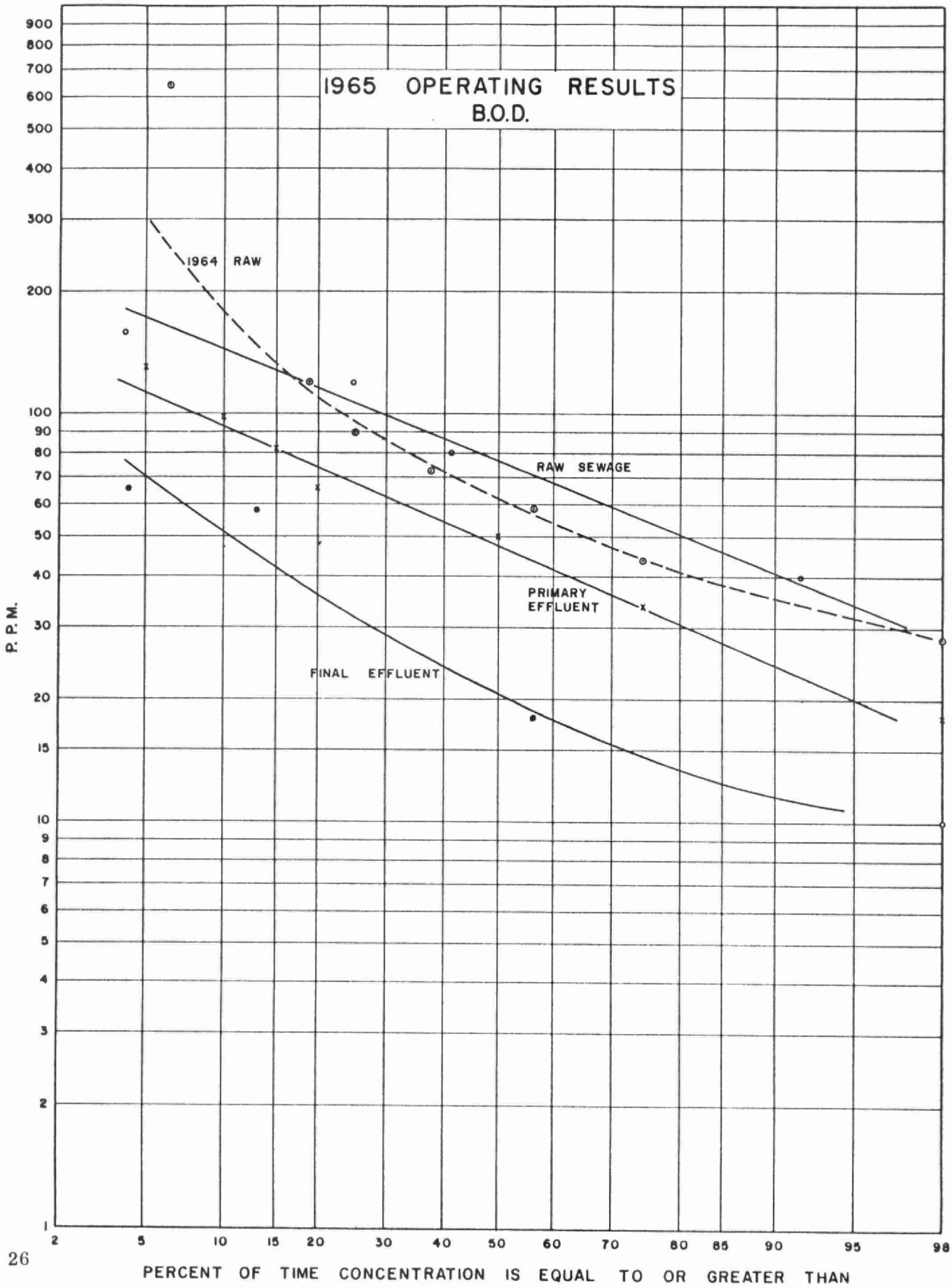

AVERAGE DAILY FLOW
M.G.D.
5
4
3
2
1
DESIGN FLOW
JAN FEB MAR APR MAY JUNE JULY AUG. SEPT OCT NOV. DEC.
19 62
JAN. FEB MAR APR MAY JUNE JULY AUG SEPT OCT. NOV. DEC.
19 63
JAN FEB MAR APR MAY JUNE JULY AUG. SEPT OCT NOV DEC
19 64
JAN FEB MAR APR MAY JUNE JULY AUG. SEPT OCT NOV. DEC
1965
JAN. FEB MAR APR MAY JUNE JULY AUG. SEPT OCT NOV DEC.
19 ____

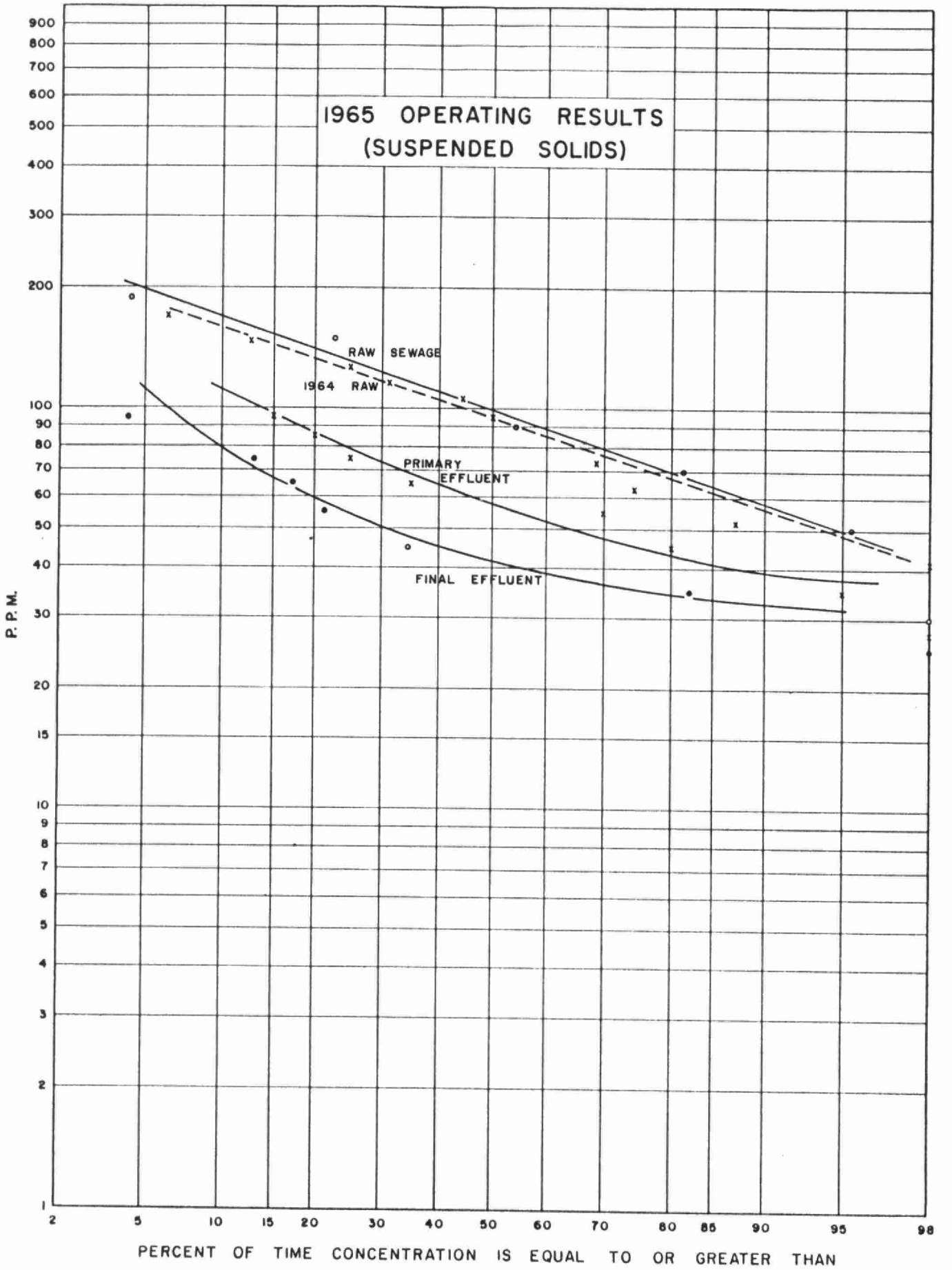

DAILY FLOWS FOR 1965
PLANT FLOW (M.G.D.)
5.0
4.0
3.0
2.0
1.0
5 10 15 20 25
JANUARY
5 10 15 20 25
FEBRUARY
5 10 15 20 25
MARCH
5 10 15 20 25
APRIL
5 10 15 20 25
MAY
5 10 15 20 25
JUNE

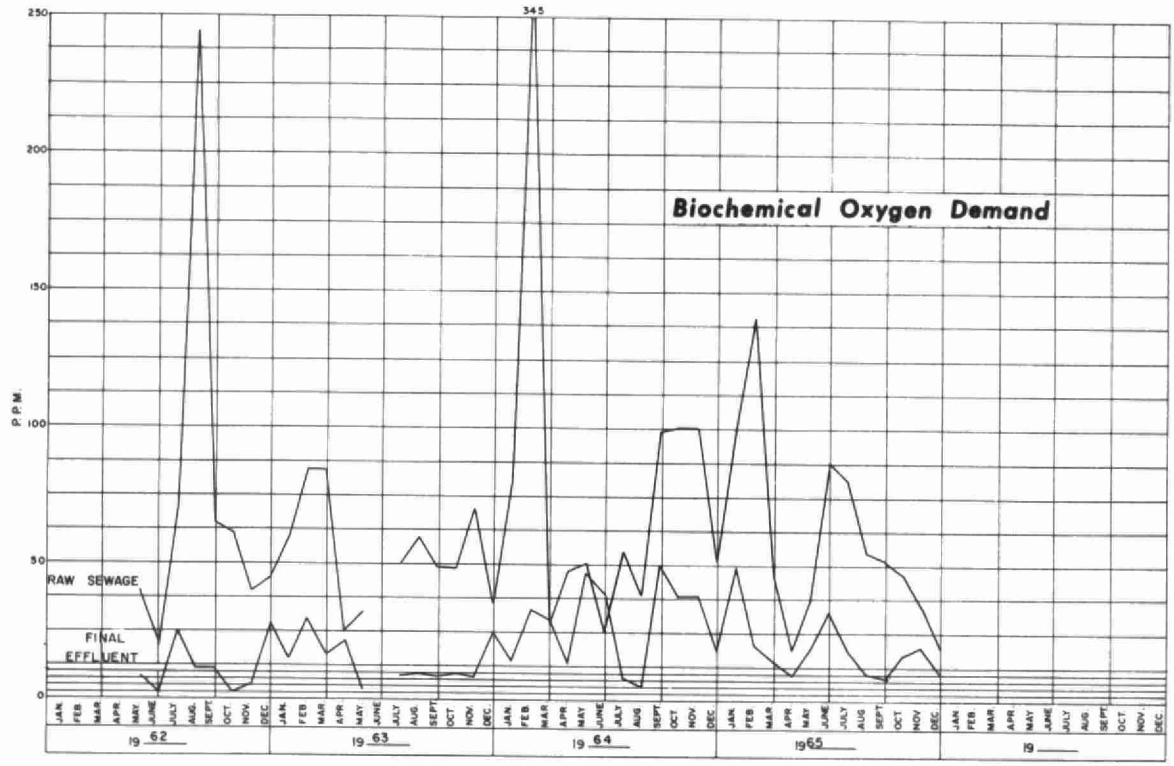

5.0
4.0
3.0
2.0
1.0
PLANT FLOW (M.G.D.)
5 10 15 20 25
JULY
5 10 15 20 25
AUGUST
5 10 15 20 25
SEPTEMBER
5 10 15 20 25
OCTOBER
5 10 15 20 25
NOVEMBER
5 10 15 20 25
DECEMBER


GRAPH OF:
(1) HIGH LEVELS IN WET WELL VS TIME IN WOODROFFE AVE.
(2) PRECIPITATION VS. TIME.
DEPTH TO SEWAGE HIGH LEVEL (MEASURED FROM TOP OF WET WELL) IN FEET
32
30
28
26
24
22
20
18
16
14
12
10
1
2
JAN.
FEB.
MAR.
APR.
MAY
JUNE
JULY
AUG.
SEPT.
OCT.
NOV.
DEC.
TIME IN DAYS
PRECIPITATION IN INCHES
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0

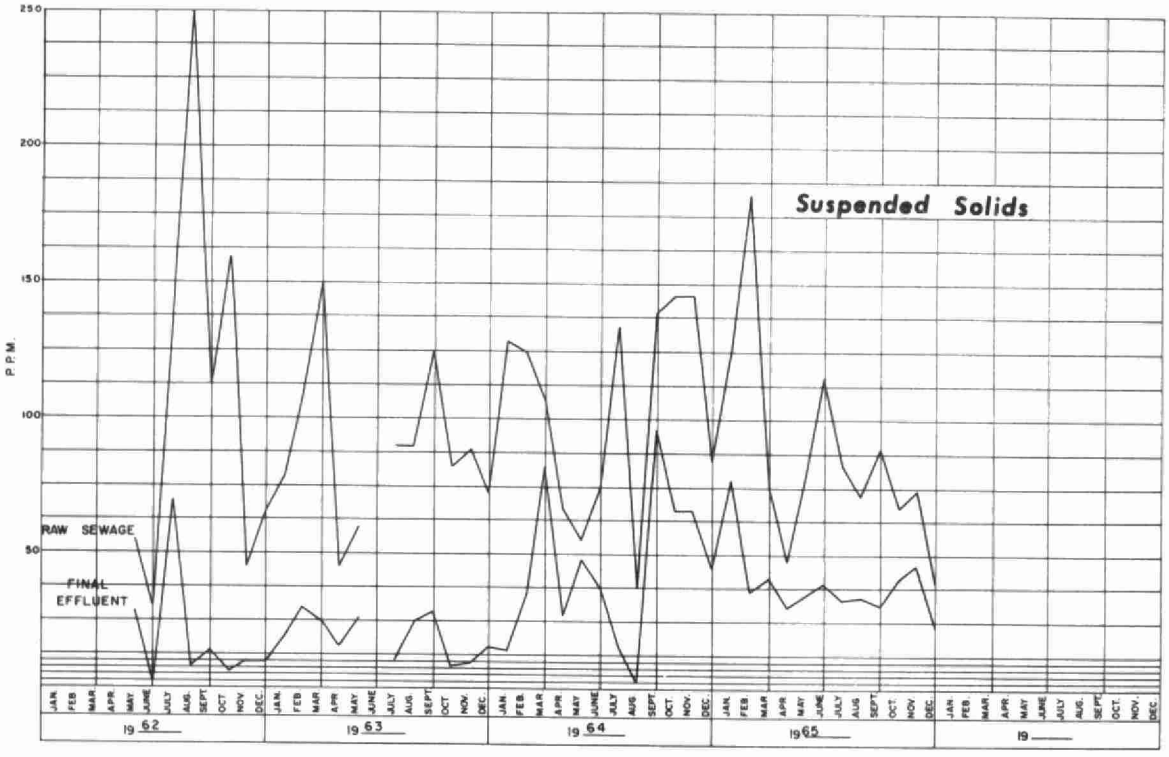

TOTAL PLANT REMOVAL
REMOVAL IN TONS PER MONTH
100
90
80
70
60
50
40
30
20
10
TONS S.S.
TONS B.O.D.
JAN FEB MAR APR MAY JUNE JULY AUG. SEPT OCT. NOV. DEC.
19 62
19 63
19 64
19 65
19


1965 OPERATING RESULTS
B.O.D.
1964 RAW
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
P. P. M.
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
15
10
9
8
7
6
5
4
3
2
1
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
PERCENT OF TIME CONCENTRATION IS EQUAL TO OR GREATER THAN


1965 OPERATING RESULTS
(SUSPENDED SOLIDS)
RAW SEWAGE
1964 RAW
PRIMARY
EFFLUENT
FINAL EFFLUENT
P. P. M.
900
800
700
600
500
400
300
200
100
90
80
70
60
50
40
30
20
15
10
9
8
7
6
5
4
3
2
1
2
5
10
15
20
30
40
50
60
70
80
85
90
95
98
PERCENT OF TIME CONCENTRATION IS EQUAL TO OR GREATER THAN



MONTHLY VARIATIONS



GRIT, B.O.D AND S.S. REMOVAL

MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	INFLUENT P.P.M.	EFFLUENT P.P.M.	% REDUCTION	TONS REMOVED	
JAN.	99	49	50.5	12.3	126	78	38.0	11.8	-
FEB.	141	20	86.0	20.5	183	36	80.5	24.9	-
MAR.	46	14	69.5	11.8	76	41	46.0	12.9	-
APR.	18	9	50.0	4.3	48	31	35.5	8.1	-
MAY	42	18	57.0	9.6	78	34	56.5	17.5	-
JUNE	88	32	63.5	14.9	114	56	51.0	15.4	48
JULY	81	18	77.5	19.3	84	33	60.5	15.6	-
AUG.	55	10	82.0	16.0	72	34	52.5	13.6	-
SEPT.	51	8	84.5	15.1	88	31	64.7	20.0	30
OCT.	46	13	71.5	14.6	68	40	41.0	12.4	-
NOV.	39	18	54.0	10.9	74	46	38.0	14.5	-
DEC.	19	10	47.5	4.8	39	24	38.5	7.9	-
TOTAL	-	-	-	186.1	-	-	-	212.7	78
AVG.	60	18	70.0	15.5	88	40	54.5	17.7	6.5

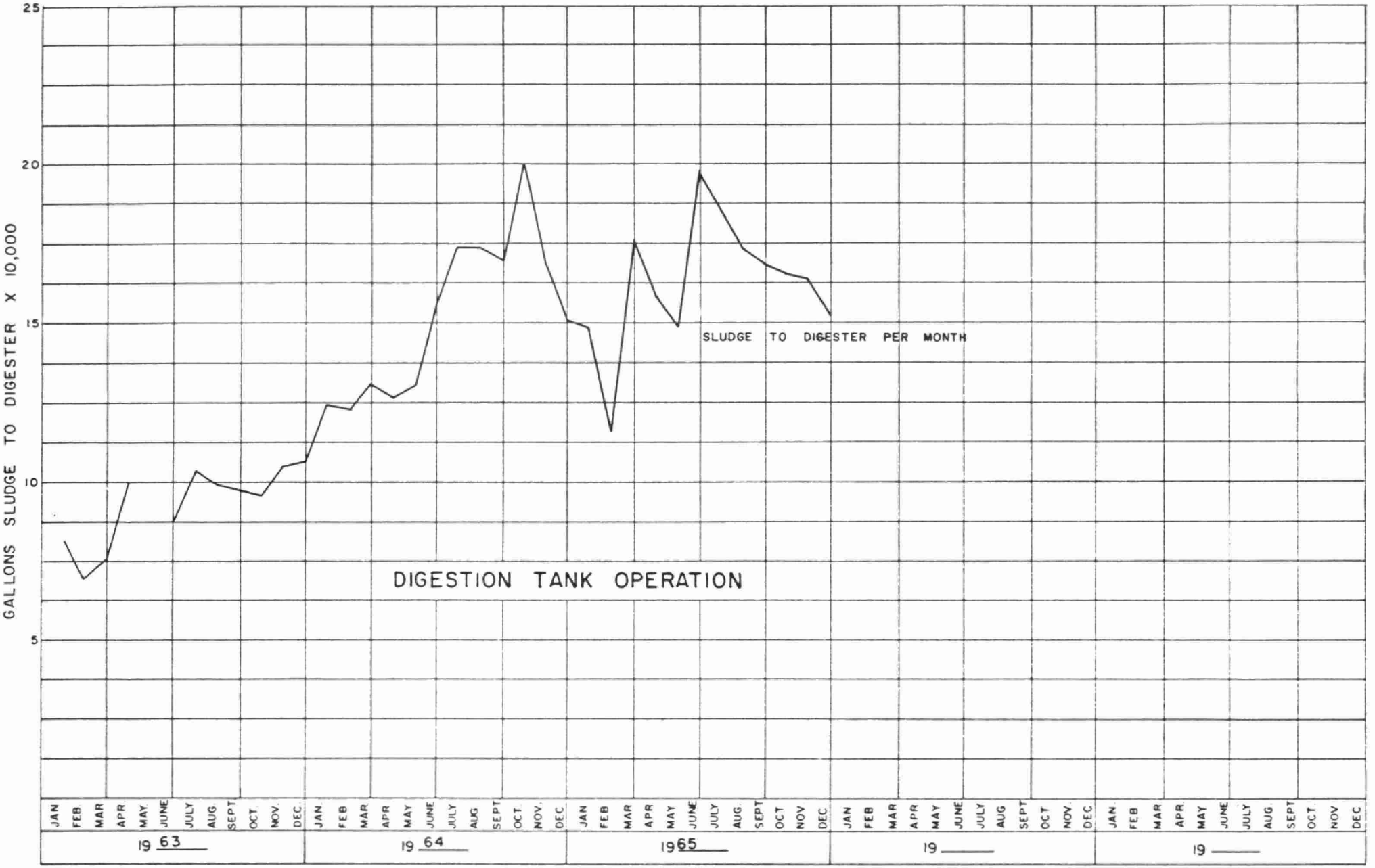
COMMENTS

The average strength of waste received at the plant in 1965 was 60 ppm BOD and 88 ppm SS. It would appear that the waste was rather weak. However, the plant is staffed for only 8 hours per day and the loading does not reach the plant until about noon, consequently, the composite samples contain 50% night flow.

The concentration of BOD and SS in the effluent exceeds at times the OWRC objectives, but this is primarily due to the hydraulic overload.

The average BOD removal was 70% and the average SS removed was 54.5%.

One hundred and eighty six tons of BOD were removed from the waste in 1965 and two hundred and twelve tons of suspended solids.


GALLONS SLUDGE TO DIGESTER X 10,000
25
20
15
10
5
SLUDGE TO DIGESTER PER MONTH
DIGESTION TANK OPERATION
JAN FEB MAR APR MAY JUNE JULY AUG. SEPT OCT. NOV. DEC.
19 63
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
19 64
JAN FEB MAR APR MAY JUNE JULY AUG. SEPT OCT NOV DEC.
1965
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV. DEC.
19 ____
JAN FEB MAR APR MAY JUNE JULY AUG. SEPT OCT NOV DEC
19 ____

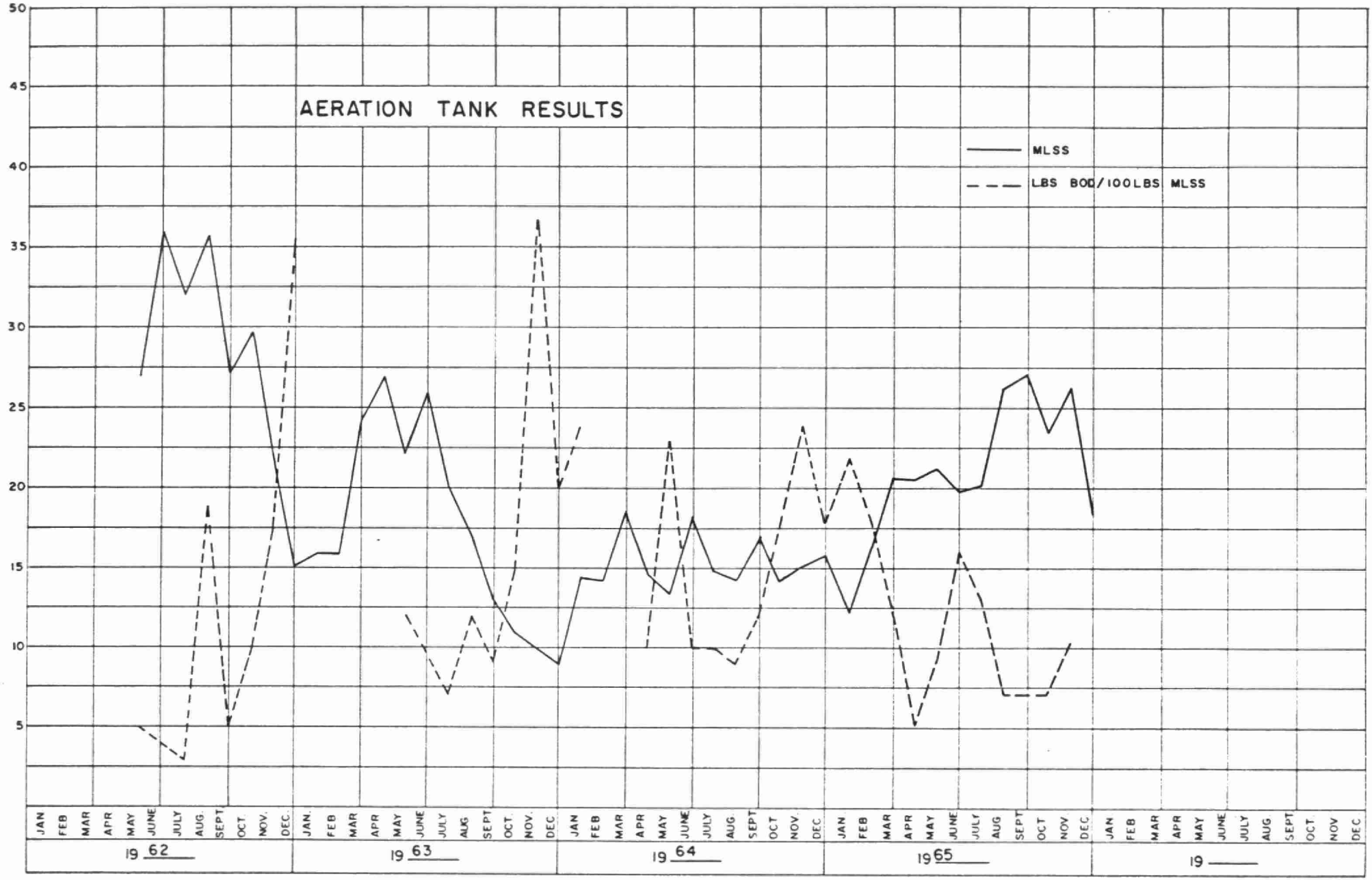
DIGESTER OPERATION

Month	Sludge to Digesters 1,000 cu. ft.	Sludge from Digesters 1,000 cu. ft.
January	23. 85	-
February	18. 67	-
March	28. 27	-
April	25. 38	-
May	23. 85	11. 30
June	31. 97	6. 73
July	29. 94	14. 18
August	27. 82	9. 38
September	26. 92	8. 89
October	26. 15	7. 84
November	26. 25	10. 82
December	24. 34	5. 77
Total	313. 41	74. 91
Average	26. 12	9. 36

COMMENTS

A total of 313,400 cubic feet of sludge were removed from the primary sedementation tanks. This is an increase of 1780 cubic feet of sludge from 1964.

The digested sludge is pumped to the sludge lagoons for drying.


AERATION TANK RESULTS
MLSS
LBS BOD/100LBS MLSS
50
45
40
35
30
25
20
15
10
5
JAN FEB MAR APR MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
19 62
19 63
19 64
19 65
19

MONTH	PRIM. EFFL. B.O.D. P.P.M.	M.L.S.S. P.P.M.	LBS. B.O.D. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. B.O.D. REMOVED
JANUARY	79	1216	22	–
FEBRUARY	92	1614	18	–
MARCH	44	2057	12	–
APRIL	12	2051	5	–
MAY	35	2123	9	–
JUNE	66	1985	16	–
JULY	51	2034	13	–
AUGUST	30	2366	7	–
SEPTEMBER	34	2690	7	–
OCTOBER	19	2338	7	–
NOVEMBER	30	2605	10	–
DECEMBER	–	1843	–	–
TOTAL	–	–	–	–
AVERAGE	45	2077	11	–

COMMENTS

The BOD loading to the aeration tanks was rather low. As previously stated, the sampling program does not reflect a true plant loading.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	49.239	-	-
FEBRUARY	33.908	-	-
MARCH	73.435	-	-
APRIL	95.524	-	-
MAY	79.715	*630	3.06
JUNE	53.152	1572	2.96
JULY	61.400	1690	2.75
AUGUST	71.321	1573	2.20
SEPTEMBER	70.188	1683	2.40
OCTOBER	88.535	**1155	2.38
NOVEMBER	103.749	-	-
DECEMBER	105.941	-	-
TOTAL	886.107	8303	-
AVERAGE	73.842	1384	2.55

* 8 days chlorination
** 17 days chlorination

COMMENTS

Chlorination was practised at the plant from May 23 to October 17, 1965 for disinfection of the final effluent. Approximately 2.55 ppm of chlorine was necessary to obtain a 0.5 ppm chlorine residual after a retention period of 15 minutes.

LABORATORY LIBRARY
9693600011938 5

RECOMMENDATIONS

1. The Shirley's Bay Water Pollution Control Plant should be enlarged as soon as possible.

2. The Woodroffe Avenue Pumping Station should be modernized and enlarged as suggested in the report prepared by the firm of Gore & Storrie Ltd., Consulting Engineers.

3. The heating capacities of the plant should be properly enlarged when the plant is expanded.

4. Every effort should be made to minimize the amount of ground and surface water infiltration into the sanitary sewer system.


ONTARIO WATER RESOURCES COMMISSION